

IP 00-0043-CR 1 H/F United States v. Havvard
Judge David F. Hamilton

Signed on 10/05/00

INTENDED FOR PUBLICATION AND PRINT

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF INDIANA
INDIANAPOLIS DIVISION

| | | |
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| USA, |) | |
| |) | |
| Plaintiff, |) | |
| vs. |) | |
| |) | |
| HAVVARD, WADE M, |) | CAUSE NO. IP00-0043-CR-01-H/F |
| |) | |
| Defendant. |) | |

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UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF INDIANA
INDIANAPOLIS DIVISION

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|---------------------------|---|------------------------------|
| UNITED STATES OF AMERICA, |) | |
| |) | |
| Plaintiff, |) | |
| |) | CAUSE NO. IP 00-43-CR-01 H/F |
| v. |) | |
| |) | |
| WADE HAVVARD, |) | |
| |) | |
| Defendant. |) | |

ENTRY ON DEFENDANT'S MOTION TO EXCLUDE OPINION
TESTIMONY ON FINGERPRINT IDENTIFICATION

Defendant Wade Havvard was charged with being a felon in possession of firearms and ammunition in violation of 18 U.S.C. § 922(g)(1). Before trial, Havvard filed a motion *in limine* seeking to bar the government from offering an expert opinion on whether a latent fingerprint recovered from one of the firearms in question matched Havvard's left index finger. Havvard contends that opinion evidence on latent fingerprint identification does not meet the standards of reliability for admissible expert testimony under *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), and *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999).

Before trial, the court held an evidentiary hearing on the motion. The court denied defendant's motion and provided an oral explanation. The court's decision may strike some as comparable to a breathless announcement that the sky is blue and the sun rose in the east yesterday. Nevertheless, *Daubert*

and *Kumho Tire* invite fresh and critical looks at old habits and beliefs. This entry provides the court's explanation in written form at the government's request because it may be useful to other courts.

I. *The Requirements of Daubert and Kumho Tire for Expert Testimony*

Daubert and *Kumho Tire* require district judges to act as “gatekeepers” of expert testimony, to ensure that proffered expert testimony is sufficiently (a) relevant and (b) reliable to justify its submission to the trier of fact. See *Kumho Tire*, 526 U.S. at 152; *Daubert*, 509 U.S. at 589. In this case there is no issue of relevance. An expert's opinion that Havvard's left index finger was the source of a latent print on a firearm found under a mattress is highly relevant to show that Havvard had possession of that firearm at a relevant time.¹

The issue here is reliability. The gatekeeping requirement is designed “to make certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field.” *Kumho Tire*, 526 U.S. at 152. In *Daubert* the Court identified several factors that may be relevant in evaluating the reliability of an expert's method for developing a relevant professional opinion. These include whether the theory or technique can be and has been tested; whether it has been subjected to peer review and publication; whether there is a high known or potential rate of error; whether there are

¹At trial Havvard argued the evidence did not show he ever had actual or constructive possession of firearms and ammunition found in the upstairs rooms of his great-grandmother's house where he was staying at the time of his arrest. The government offered the expert opinion testimony that one latent print left on one of the firearms in question came from Havvard's left index finger. The jury found Havvard guilty as charged.

standards controlling the technique's operations; and whether the theory or technique enjoys general acceptance within a relevant scientific or expert community. See *Kumho Tire*, 526 U.S. at 149-50, citing *Daubert*, 509 U.S. at 592-94.

In *Kumho Tire*, the Court explained that the *Daubert* gatekeeping function applies to all kinds of experts, without drawing distinctions between scientific experts and other types. The Court also explained in *Kumho Tire* that the *Daubert* factors on reliability were neither mandatory nor exclusive. Rather, “the trial judge must have considerable leeway in deciding in a particular case how to go about determining whether particular expert testimony is reliable. That is to say, a trial court should consider the specific factors identified in *Daubert* where they are reasonable measures of the reliability of expert testimony.” 526 U.S. at 152.

In this case, Havvard contends in essence that an opinion about whether a given latent fingerprint is from a particular finger is a subjective opinion that is not sufficiently reliable to be admitted. Although the argument may seem improbable, Havvard pointed out that the examiner designated to testify at trial about the fingerprint refused to identify a given standard in terms of the number of “points” or features that must be identical between the latent print and the comparison print before an identification opinion can be given. In addition, when that examiner testified at Havvard’s trial, he described his opinion as “subjective.”

The refusal to provide a clear standard and the expert’s description of his opinion as “subjective” at least raise a fair question about identification opinions under *Daubert* and *Kumho Tire*. See *Kumho Tire*, 526 U.S. at 144-45, 157-58 (upholding exclusion of opinion about cause of tire failure based on

experience and visual inspection, and absence of at least two of four supposed signs of underinflation where methodology was not shown to be reliable). Havvard argues further that there is no reliable statistical foundation for fingerprint comparisons and no reliable measure of error rates in latent print identification, especially in the absence of a specific standard about the number of points of identity needed to support an opinion as to identification. Havvard thus compares latent fingerprint identification to handwriting analysis or hair fiber comparisons, which also have been challenged in the wake of *Daubert*.

For decades courts have been allowing persons trained and experienced in latent fingerprint identification to testify about their opinions as to whether a given individual was the source of a latent print. The government suggested in response to Havvard's motion that fingerprint identification is so well-established that the court should not even hold a hearing on the issue, citing *United States v. Cooper*, 91 F. Supp. 2d 79, 82-83 (D.D.C. 2000) (rejecting non-specific request for pretrial hearing on government's expert testimony in well-established and generally accepted fields). The government proposed that the court essentially take judicial notice of the reliability of latent print identification and leave any further challenges to cross-examination. Cases prior to *Daubert* support this approach. See, e.g., *People v. Jennings*, 96 N.E. 1077, 1081-82 (Ill. 1911) (early leading case recognizing validity of fingerprint identification testimony); *Piquett v. United States*, 81 F.2d 75, 81 (7th Cir. 1936) ("This court will take judicial knowledge of the well recognized fact that identification by finger prints is about the surest method known, and that it is in universal use in the detection of criminals."); *United States v. Magee*, 261 F.2d 609, 612 (7th Cir. 1958) ("Obviously there can be no more reliable evidence of the identity of a defendant than his own fingerprints.").

The parties have not called the court's attention to any reported cases rejecting fingerprint identification opinion testimony. From the post-*Daubert* era, the government has provided the transcript of an oral ruling by Judge Joyner rejecting a similar challenge after a *Daubert* hearing lasting several days in *United States v. Mitchell*, 96-407-CR (E.D. Pa. Sept. 13, 1999), and an unpublished report and recommendation by Magistrate Judge Snow in *United States v. Alteme*, No. 99-8131-CR (S.D. Fla. April 7, 2000), rejecting another similar challenge.

In the wake of *Daubert*, however, experts in a number of different fields have faced fresh challenges as to whether their opinions are sufficiently reliable to admit into evidence. See, e.g., *Williamson v. Reynolds*, 904 F. Supp. 1529, 1556, 1558 (E.D. Okla. 1995) (excluding hair fiber comparison, but distinguishing fingerprint evidence as more reliable), *aff'd*, 110 F.3d 1508 (10th Cir. 1997), *abrogated on other grounds*, *Ross v. Ward*, 165 F.3d 793 (10th Cir. 1999); *United States v. Starzecpyzel*, 880 F. Supp. 1027, 1036-38 (S.D.N.Y. 1995) (excluding handwriting analysis).

Although a trial court has some degree of discretion in determining *how* to evaluate the reliability of expert testimony, it is clear that the court has no discretion as to *whether* to evaluate reliability. See *Kumho Tire*, 526 U.S. at 159 (Scalia, J., concurring) (district court's discretion is not discretion "to abandon the gatekeeping function" or to perform the function inadequately). This court therefore held an evidentiary hearing and has considered the issue in some detail.

II. *Identification from Latent Fingerprints*

Against that legal background, the court turns to the evidence in this case. The only evidence presented in the evidentiary hearing was the testimony of Stephen Meagher, a Latent Print Unit Chief in the Forensic Analysis Section of the FBI's Laboratory Division. Meagher has not examined the latent fingerprint in this case and did not testify at trial. He testified instead about the methods and scientific bases of latent print identification. For a helpful and detailed survey of fingerprints and their forensic uses, see also Moenssens, Starrs, Henderson & Inbau, *Scientific Evidence in Civil and Criminal Cases* 495-554 (4th ed. 1995).

The evidence establishes that the patterns of friction ridges on fingertips, palms, toes, and the soles of the feet are unique and permanent to each individual. The prints are unique as to each finger and toe of each person. In addition, there is a biological, embryological basis for the claim of uniqueness. Friction ridge patterns are affected by genetics, but even twins with identical genes have different fingerprints.

That claim of uniqueness and permanence is a scientific claim in the sense that it can be falsified. Such falsifiability is the hallmark of a scientific claim. See *Daubert*, 509 U.S. at 593, citing C. Hempel, *Philosophy of Natural Science* 49 (1966) (“[T]he statements constituting a scientific explanation must be capable of empirical test”), and K. Popper, *Conjectures and Refutations: The Growth of Scientific Knowledge* 37 (5th ed. 1989) (“[T]he criterion of the scientific status of a theory is its falsifiability, or refutability, or testability”) (original emphasis deleted).

In the roughly 100 years since fingerprints have been used for identification purposes, no one has managed to falsify the claim of uniqueness by showing that fingers of two persons had identical fingerprints.

Nor has anyone shown that the distinctive characteristics of one person's fingerprints changed over time (apart from readily explainable changes such as growth and scarring).

For purposes of identification, an examiner generally uses a full "rolled" set of fingerprints taken under controlled circumstances. The process is a familiar one. Ink or some other substance is put on the fingers. One can then obtain a clear, high quality impression of the entire surface by carefully rolling the fingers on a card or piece of paper.

Latent prints are left by substances such as sweat, oil, or blood on the friction ridges and deposited on a surface, such as glass, paper, or the metal surface of a gun. The latent prints provide an image of the friction ridges. Persons skilled in recovery of latent fingerprints can use various techniques to obtain a clear image of the latent print that can then be used for purposes of comparison to known exemplars. Latent prints are usually prints of only a relatively small portion of the friction ridges on a particular finger. Latent prints can also vary widely in terms of the quality and clarity of the image.

Comparison of fingerprints for purposes of identification focuses on three different levels of details. Level one is the largest scale of information, such as the general type of the central area of the fingerprint, such as an arch, whorl, or loop. Other level one details may include such matters as the overall ridge count, focal areas of the print, such as "delta regions" (roughly triangular shaped areas where ridges flowing in different directions meet), and the orientation of the print. Showing that level one details are identical is not enough to make an identification of the finger that is the source of a latent print.

Level two detail focuses on the characteristics of ridge paths, such as places where ridges bifurcate or end or create dots or islands. These features provide a great deal of detail. Each feature can be identified in terms of the type of feature (end, bifurcation, etc.), its direction, and its location with respect to other identifiable features in the print. Level two detail can be used to identify one individual finger from among the entire human population as the source of the latent print.

Level three detail can be described as “ridge detail,” with such tiny features as pores on a ridge and the width and shape of the ridge itself and its edges. These level three details are the most vulnerable to problems with the quality of the latent print. They are so small that a clear, high quality image is needed to make accurate comparisons. Meagher’s testimony shows that when the latent print is sufficiently clear, level three detail can contribute to the identification of the source of a latent print.

According to Meagher, a fingerprint examiner goes through a four-step process with the acronym “ACE-V,” for analysis, comparison, evaluation, and verification. At the first, analysis stage, the examiner studies the latent print closely and identifies the key features at levels one, two, and (if possible) three that can be used for identification purposes. The examiner then looks at a known exemplar print and analyzes it for key features. At the second, comparison stage, the examiner simply compares the latent print and the known exemplar feature by feature to see if they match up or if there are any unexplained discrepancies.

That much of the process is completely objective. Havvard does not object to expert testimony that would simply show a jury the latent print and a known exemplar and then describe any similarities and differences. Havvard objects to the third step, evaluation, in which the examiner forms and later testifies

to an opinion as to whether the latent print and the known exemplar are from the same finger, or are not from the same finger, or whether the examiner has insufficient information to make a determination either way.

Meagher testified that there is no single quantifiable standard for reaching an identification opinion because of differences in both the quantity of characteristics shown in the latent print and the quality of the image. For example, if a latent print shows a relatively small portion of a fingerprint but has a very clear image – one that allows clear identification of level three detail such as the shapes of ridges, locations of pores, and the like, a reliable identification may still be possible even with relatively few level two “points.”

Meagher’s explanation makes sense, and the court credits it. See also Moenssens, *et al.*, Scientific Evidence in Civil and Criminal Cases at 514-16 (by tradition, latent print examiners in the United States have required a match of at least six to eight characteristics to show identity, but most experts prefer at least ten to twelve; in English courts 14 to 16 matches are required for identity). Professor Moenssens also reports the results of study conducted for the International Association for Identification, which concluded that there was no valid basis for requiring a predetermined minimum number of ridge characteristics, and that an identification opinion must take into account other factors, including the quality and clarity of the impressions. *Id.*

The most important point at the evaluation stage, however, is that a single unexplained discrepancy between the latent print and a known exemplar is sufficient to prove conclusively that the exemplar was not the source of the latent print.²

The final step in the process is verification. Meagher testified that the general rule is that all positive identification opinions must be verified by a second qualified expert. The second expert may repeat the entire process, but the comparison may not be blind. That is, the second expert may know from the outset that another examiner has already made the positive identification.

III. *Applying Daubert to Latent Fingerprint Identification*

The court has adapted the *Daubert* reliability factors to this case, and those factors strongly support the reliability of latent print identification despite the absence of a single quantifiable threshold.

First, the methods of latent print identification can be and have been tested. They have been tested for roughly 100 years. They have been tested in adversarial proceedings with the highest possible stakes – liberty and sometimes life. The defense has offered no evidence in this case undermining the reliability of the methods in general. The government points out correctly that if anyone were to come across a case

²The reference to an “unexplained” discrepancy does not appear to be a significant loophole in the method. The shape of the material bearing the latent print and distortions in shape resulting from pressure as a finger is applied to the surface can affect the shape and clarity of the print, but they cannot change the critical characteristics (such as level two detail) of the friction ridges. Professor Moenssens and his colleagues described some other explanations for discrepancies in *Scientific Evidence in Civil and Criminal Cases* at 548. For example, dirt or dust may cause a ridge to appear as one or two islands, or powder used to develop a print may stick between ridges, falsely indicating the presence of a ridge characteristic.

in which two different fingers had identical fingerprints, that news would flash around the legal world at the speed of light. It has not happened in 100 years.

Further, the methods can be tested in any individual case. Any identification opinion must be based on objective information – the latent image and the known exemplar – that is equally available to any qualified examiner for comparison and possible disagreement. A single unexplained discrepancy between a latent print and a known exemplar is enough to falsify an opinion of identification.

Next, the methods of identification are subject to peer review. As just stated, any other qualified examiner can compare the objective information upon which the opinion is based and may render a different opinion if warranted. In fact, peer review is the standard operating procedure among latent print examiners.

Daubert refers to publication after peer review, which is important in evaluating scientific evidence because it shows that others qualified in a field have evaluated the method or theory outside the context of litigation and have found it worthy of publication. The factor does not fit well with fingerprint identification because it is a field that has developed primarily for forensic purposes. The purpose of the publication factor is easily satisfied here, however, because latent fingerprint identification has been subject to adversarial testing for roughly 100 years, again in cases with the highest stakes possible. That track record provides far greater assurance of reliability than, for example, publication of one peer-reviewed article describing a novel theory about the cause of a particular disease at issue in a civil lawsuit.

Another *Daubert* factor is whether there are standards for controlling the technique. There are such standards through professional training, peer review, criticism, and presentation of conflicting evidence.

Another *Daubert* factor is whether there is a high known or potential error rate. There is not. The defense has presented no evidence of error rates, or even of any errors. The government claims the error rate for the method is zero. The claim is breathtaking, but it is qualified by the reasonable concession that an individual examiner can of course make an error in a particular case. See Moenssens, *et al.*, Scientific Evidence in Civil and Criminal Cases at 516 (“in a great number of criminal cases” defense experts have undermined prosecution by showing faulty procedures or human errors in use of fingerprint evidence). Most important, an individual examiner’s opinion can be tested and challenged for error by having another qualified examiner compare exactly the same images the first one compared. See also *Daubert*, 509 U.S. at 596 (“Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.”).

Even allowing for the possibility of individual error, the error rate with latent print identification is vanishingly small when it is subject to fair adversarial testing and challenge. It is certainly far lower than the error rate for other types of opinions that courts routinely allow, such as opinions about the diagnosis of a disease, the cause of an accident or disease, whether a fire was accidental or deliberate in origin, or whether a particular industrial facility was the likely source of a contaminant in groundwater. As these examples indicate, the fact that some professional judgment and experience is required also does not mean that expert testimony is inadmissible. It is instead the hallmark of expert testimony, so long as it can otherwise meet the standards of reliability set forth in *Daubert* and *Kumho Tire*.

In sum, despite the absence of a single quantifiable standard for measuring the sufficiency of any latent print for purposes of identification, the court is satisfied that latent print identification easily satisfies the standards of reliability in *Daubert* and *Kumho Tire*. In fact, after going through this analysis, the court believes that latent print identification is the very archetype of reliable expert testimony under those standards. At the request of the government, the court has prepared this written opinion so that other courts might avoid unnecessarily replicating the process of establishing these points as they try to ensure they comply with the Supreme Court's directive to ensure that *all* types of expert testimony are subject to screening for reliability.

For the foregoing reasons, defendant Havvard's motion to exclude the government's proffered opinion testimony on the source of the latent fingerprint on one of the firearms in this case was denied. The defendant had his own consulting expert on fingerprint issues. He also had the opportunity at trial to call his own witness to offer a different opinion or to show the jury if there was any discrepancy between the latent print on the firearm and the known print of the defendant's index finger. He did not do so.

Date: October 5, 2000

DAVID F. HAMILTON, JUDGE
United States District Court
Southern District of Indiana

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